

## REMARKS

In response to the above-mentioned Office Action dated 09/30/2008, claim 17 has been canceled such that the patent application is now in condition allowable.

Regarding rejection of claims 1, 11, 17 and 18 under 35 USC § 103 as being unpatentable over Montmory (4,362, 271) in view of U.S. Patent No. 5,357,865 to Mather and further in view of U.S. Patent No. 3,613,992 to Knollenberg, and even further in view of U.S. Patent No. 6,056,203 to Fukuta.

As 35 USC § 103(a)

*A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.*

Applicant would like to contend that all the four U.S. Patents cited above as prior arts have not performed the steps of rainmaking as that of Royal Rainmaking Technology (RRT) cited by the Examiner. Montmory ('271) does not teach the use of sodium chloride nor calcium chloride for activation of a cloud formation or 'triggering' as of RRT as cited. On the contrary, '271 (Cl.1-12, 17-18) uses dimethyl sulfoxide (DMSO) as principle active ingredient as microdroplets having the salts (NaCl, CaCl<sub>2</sub>, etc) 0.1 to 15% to stabilize the microdroplets while prevent or limit their evaporation (Table 1. No. 1-5). All what '271, '865', '992 and '203 teach is a single step of 'attacking' using liquid DMSO ('271), liquid CO<sub>2</sub> ('203) or solid (mixture Na, K, Mg salts-'865; urea &/or salts-'992), NONE performs the building up cloud mass or activation of cloud formation. Thus, all of them operate to achieve the outcome **in an opposite direction** to that of RRT. Montmory ('271) teaches

spraying of microdroplets of DMSO as **principal ingredient** from the ground or from aerial devices (such as rockets, airplanes or helicopter) in the clouds or ..... (Col.4, l. 32-59) NOT the salt(s) (neither sodium chloride nor calcium chloride as powder) itself dispersed, in an atmosphere **likely to give rise to precipitations** such as a cloud of fog, microdroplets which will expand rapidly once the relatively humidity of the air exceeds 40-50 percent and will reach, at saturation, with respect to ice (below 0°C) and with respect to water (above 0°C), dimensions which can be as great as 50 to 100 microns or even more, all while remaining in the liquid state, even supercooled at temperature below freezing, despite the effects of dilution (Col.3, l. 31-40). This is an operation to **cause precipitation from a preexisting cloud of fog** NOT activation of cloud formation, where (in '271, Col.3, l. 18-20) **one major merit of '271 procedure is precisely the production of hydrometeors in the liquid, instead of solid, state.** Thus, '271 **never uses solid form** of substance, and **never discloses** activation of cloud formation, and actually, '271 operates using liquid form of substance, **DMSO** (and NOT salt) as principal ingredient **only** for causing precipitation comparable to the step 'attacking' of RRT. (See Table 1. No. 5). The phrase "**likely to give rise to precipitations**" is self-explicit that the humidity is quite high and ready to precipitate. In other word, **none of the prior arts** teaches the use of **powder sodium chloride alone for building up of a cloud mass** (Triggering), nor the use of **powder calcium chloride for growing the cloud mass bigger** (Fattening) as taught in RRT.

The Examiner (p. 3, l. 9-15) further cited that components of the teaching of 'attacking' not taught by Montmory are taught by the combination of the procedures taught by Mather ('865) and Knollerberg ('992). Applicant would like to contend that Montmory uses liquid DMSO to cause precipitation and Mather ('865) although uses sodium chloride, it is NOT used singly, but used as a mixture of pyrotechnic formulation (Cl. 2-5) and is burnt in a seeding flare and only for precipitation enhancement (Cl. 1). Thus, it is used as mixture and

burnt. While Knollenberg ('992; Cl.1) introduces finely divided solid substance (urea) into a **natural atmospheric cloud mass** to cause precipitation, yet he does not define any specific position of the cloud mass as what taught in RRT. Therefore, to cause precipitation from a cloud mass, RRT teaches dispersion of powder sodium chloride as single component at mid-cloud level, and simultaneously, dispersion of urea powder at cloud base. This results in huge amount of rainfall much better than use of any one of the substance alone. In fact, RRT teaches the process as a whole having a total of 4 steps, starting right from building up of a cloud mass ('Triggering' which is not taught by any of the prior arts cited by the Examiner), growing of cloud mass ('Fattening', -none of the prior art teaches use of calcium chloride in making the cloud mass growing bigger and bigger), causing precipitation from the cloud mass using 2 chemicals simultaneous dispersed into different positions of a cloud mass ('Attacking' –prior arts use only single component to be dispersed or a mixture of salt burnt in the seeding flares), and finally getting much more rainfall with longer duration of raining ('Enhancing' – none of the prior arts teach use of flakes of dry ice dispersed underneath a cloud mass). This whole sequential integrated protocol has never been taught by any of the prior art with a special step of 'Triggering' where use of Sodium chloride is for an opposite purpose than those in the prior arts cited by the Examiner. This whole process is certainly of much greater advantage over those in the prior arts which cause precipitation only from a pre-existing natural cloud mass. Thus, the whole process should be surely patentable under 35 U.S.C. § 101 which reads

*"Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter or any new and useful improvement thereof, may obtain a patent therefore, subject to the conditions and requirements of this title".*

As per claim 17, claim 17 has now been canceled.

Examiner himself further cited (p.3, l.22- p. 4, l. 1-6) that 'Neither Montmory ('271) nor Mather ('865) and Knollenberg ('992) teach the process of 'enhancing'. Fukuta ('203) teaches to 'enhance' the volume of rainfall by the use of **silver iodide** flares seeded into the top of a cloud and further discloses that ice crystals formed are by the use of silver iodide flares and..... . The FACT is that Fukuta **never** uses AgI for 'Enhancing', what he uses is only liquid carbon dioxide being sprayed laterally from nozzles of the aircraft to produce ice crystals. Yet, on the contrary, he does also mention that ice nucleation by AgI smoke particles does not function well under the condition described that 'a cumulus cloud grows.....without causing a significant amount of precipitation (Col.2, 1.23-44). Now, it should be clearly evident from what cited by the examiner and what disclosed in '203 that **NONE** of the prior art teach the step of 'Enhancing' as described in the RRT.

Thus, it has to be emphasized again and again that neither step of 'Triggering' nor 'Fattening' nor 'Enhancing' was taught in any of the prior arts and the step of 'Attacking' performed in RRT is distinctly different with respect to the substance and the position of the cloud to be treated. In addition, when all these steps are put together as a whole, the whole sequential process is thus an innovation NEVER been taught before. These are all never been obvious at all to a person having ordinary skill in the art, such that 1, 11, and 18 should not be rejected under 35 USC § 103(a).

As per claim 18, cited by the Examiner (p. 4, l. 6-12) that 'By combining Montmory ('271), Fukuta ('203), Mather ('865) and Knollenberg ('922), the Super Sandwich technique is taught, and, as per claim 18. Montmory teaches.....prevent hail. As clearly explain above, '203 never uses AgI; '271 uses only liquid form as microdroplets of DMSO; '865 uses mixture of salt burnt in a seeding flare, '992 uses fine powder of urea;

even in combination either in general or in detail is distinctly different when consider Super Sandwich Technique as a whole. Claim 18 is thus retained.

As per claims 13, 14, 16 and 20 that they are rejected (p.4, l.13-18) under 35 USC § 103(a) as being unpatentable over '865 to Mather in view of '271 to Montmory and further in view of '785 to Nelson et al. and even further in view of '992 to Knollenberg, and still even further in view of '455 to Fukuta and yet still even further in view of '203 to Fukuta. As per claim 14 (p.4, l.21), the Examiner cited that the technique of relocating a cloud, referred to RRT as 'moving', is taught by Nelson et al. ('785).

The Fact is that '785 never teaches 'moving', they teach only removing of water vapor from the atmosphere (Cl.1) to work as 'fog dissipation' (Col.1, l.9-17), there is not a single word anywhere in the disclosure referred to as moving of cloud. They use the microencapsulation technology to provide size control and stabilization of seeding agent.

Furthermore, they use only encapsulated non-corrosive seed agent, i.e. crystalline urea and not calcium chloride for removing water vapor to dissipate fog.

No where in the disclosure ('785) teaches the moving of cloud from one area to another specified area as in RRT. In all their claims, the feature protected are only the encapsulation in a moisture permeable coating of the finely divided hygroscopic particulate material and the range of size.

Calcium chloride (Col.2, l.30-34) is referred to as corrosive hygroscopic material used for fog dissipation over harbors.....etc. and is not used in their disclosure.

Thus, NONE of the prior arts teaches relocation of cloud. Claim 14, therefore can not be rejected under 35 USC § 103(a).

Regarding claim 16, since ‘fattening’ is not taught by any of the prior arts as addressed above and ‘Attacking’ of RRT is distinctly different than any technique of the prior arts as to the substance and the position of the cloud to be seeded, claim 16 is thus an innovation and patentable.

Regarding claim 20, NONE of the prior arts teaches such protocol which is quite specific regarding the type of the cloud to be seeded and the manner the operation is performed, i.e., alternate dropping of hygroscopic chemicals on top of clouds. This is one of the most useful technique of rainmaking in a rather close area locates in between many mountain tops. As a whole, this claim 20 is patentable and thus allowable.

In conclusion:

1. **None of the Prior Arts teach building up of a cloud mass using powder NaCl; all of them teach causing precipitation from a natural pre-existing cloud using variety of substance. That is the operation results in OPPOSITE outcome . No steps of ‘Triggering’, ‘Fattening’ and ‘Enhancing’ in the Prior Arts using the same chemicals as taught by the Royal Rainmaking Technology.**
2. **None of the Prior Arts teach the use of 2 chemicals in combination to seed into specific position of a cloud mass simultaneously to cause rainfall.**

More details regarding the distinct differences between RRT and all the cited prior arts are shown in Table 1. enclosed, which describes clearly the difference of the subject matter as a whole of each step in sequence as manipulated than those prior arts where most of them teach only ONE step of ‘attacking’ with much simpler procedure than that of RRT.

Same applies for claims 13, 14, 16 and as all claims as a whole is distinctively different than what taught in the prior art with improvement and very useful application, thus may obtain a patent as under 35 U.S.C. § 101 which reads

*"Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter or any new and useful improvement thereof, may obtain a patent therefore, subject to the conditions and requirements of this title".*

As now all the distinct differences are shown of the details described in the present patent application than that of what described in the prior arts that now a patent should be obtained. Applicant thus submit and that all claims may now be allowed and would appreciate if the application is allowed in the next communication.

Respectfully submitted,

Dated: Dec 22, 2008



Dr. Ampol Senanarong

Privy Councillor

The Office of His Majesty's Principal Private Secretary  
Bangkok 10200, THAILAND.

**Table 1. Distinct Differences between subject matter  
of the present Patent application and the prior arts**

'271, '865, '992 or '203	Royal Rainmaking Technology (RRT)
<p>1. '271: Use of liquid particles, NOT solid, in all claims 1-33, where as in Col. 2 discussed the drawbacks associated with using solid particles:</p> <ul style="list-style-type: none"> <li>-Solid particles are more difficult to disperse than liquid particles;</li> <li>- solid surfaces are more sensitive to the effects of contamination;</li> <li>- the energy required to adsorb water vapor on a solid surface is much greater than that needed for a liquid surface;</li> <li>- it is difficult to obtain, store and disperse solid microparticles with dimensions measuring a few microns.....</li> </ul>	<p>1. All steps claimed throughout the operation use powder form of the salt for dispersion into the air or the cloud mass.</p>
<p>2. '271 uses microdroplets of DMSO <b>ONLY to give rise to precipitation</b> (<u>Cl.1, 12</u>) of the existing cloud which is equivalent to only the step of "Attacking" of RRT. '271 uses sodium chloride in DMSO to dissipate fog where DMSO is <b>the principal ingredient NOT the salt</b>. This is NOT the step of 'Triggering' which is the formation of cloud as cited by the Examiner (p.2, paragraph 4). <b>To the contrary</b>, '271 destroys the cloud and turns it to rain <b>NOT building up of</b> cloud mass as in RRT. Thus, the result of the operation is in <b>OPPOSITE</b> direction. Sodium chloride, lithium chloride, lithium iodide or calcium chloride is used in small amount to stabilize the microdroplets of DMSO while preventing evaporation.</p>	<p>2. RRT uses only powder of Sodium chloride for <b>building up of cloud mass</b> and call this step 'Triggering' which achieves the result <b>opposite</b> to that of Montmory ('271); where for the step 'Attacking' of RRT two chemicals are used to be dispersed into two different specified position in a cloud mass at the same time which give much more volume of rainfall, something had never been taught anywhere in the world including in all the prior arts (271 or '865 or '992 or '203).</p>
<p>3. <b>Nowhere</b> in '271 or '865 or '992 or even '203 teaches the use of solid form which is powder of hygroscopic chemical(s) for <b>building up of cloud mass</b> from humidity in the atmosphere as in RRT. All the four patents perform cloud seeding to cause only precipitation right from a <u>natural atmospheric cloud</u> ('992; 271 -Cl.1; '203-col.6, l.23-24; '865- col.3, l.27).</p>	<p>3. Building up of cloud mass is described.</p>
<p>4. There are NO steps of 'Triggering' nor 'Fattening' in '271 as cited by the</p>	<p>4. RRT teaches all 4 steps for operation of rainmaking in details to be</p>

**Table 1. Distinct Differences between subject matter  
of the present Patent application and the prior arts**

<p>Examiner (p.2, par. 4). All what '271 teaches is only the causing of precipitation which is the step of "Attacking".</p>	<p>performed consecutively with different aim for operation in each step, where each step although chemicals may be the same but the expected results are different or even opposite outcome, to achieve the best outcome of rainmaking regarding the much huger volume of rainfall and much longer duration of raining.</p>
<p>5. Although '271 (Col.3, l.31-50) teaches dispersing microdroplets of liquid (DMSO) from a device in an atmosphere likely to give rise to precipitations such as cloud of fog (pre-existing), to allow expansion of the microdroplets and once the relative humidity of the air exceeds 40 to 50 %, this is more or less close to the step 'Triggering' of RRT yet the liquid form of the salt in DMSO is used and where <b>DMSO is the principal ingredient</b> to cause precipitation not the salt and not the salt itself as principal ingredient as that of RRT. The outcome of his operation is the precipitation from the cloud of fog <b>NOT</b> building up of a cloud mass. The additional ingredient (NaCl, KCl, CaCl<sub>2</sub>, &amp;etc.) to DMSO presents the advantage of stabilizing the microdroplets while preventing or limiting their evaporation (Col.4, l.1-25).</p>	<p>5. RRT does not use liquid DMSO in any of the 4 steps of operation, where powder sodium chloride is the principal ingredient to build up a cloud mass in Triggering which is in <b>the opposite direction</b> than that of '271. This is certainly a distinct difference than that of '271 and all the other prior arts.</p>
<p>6. Mather ('865) although teaches use of sodium chloride particle <b>but it is burnt</b> in a seeding flare for <b>precipitation enhancement</b> (Cl. 1-4, Exam. Citation p.3, l.11-13) (as mixture of pyrotechnic or combustion formulation of Potassium perchlorate, Mg and NaCl). Seeding flare is a very different mean than that of RRT which uses NaCl as a single component for 'Triggering' which is the activation of cloud formation thus is used for a different purpose than that of RRT where in '865 it is used only for <b>precipitation enhancement</b> (Cl. 1-4), not the starting of the formation of cloud as in RRT. While for 'Attacking' of RRT, NaCl singly as powder NOT burnt as Flare is</p>	<p>6. For <b>precipitation enhancement</b>, RRT uses flakes of dry ice and not NaCl. RRT does not burn NaCl in the operation, while in RRT for 'attacking' or rain initiation, <u>NaCl</u>, singly and as powder, is dispersed into cloud at <u>mid-cloud level</u>, and simultaneously, <u>urea at cloud base</u> resulting in heavy rainfall.</p>

**Table 1. Distinct Differences between subject matter  
of the present Patent application and the prior arts**

<p>dispersed into cloud at mid-cloud level, and urea at cloud base.</p>	
<p>7. Knollenberg ('992), on the other hand, introduces into a <u>natural atmospheric</u> cloud the fine powder of urea to cause precipitation (comparable to 'attacking' of RRT).</p>	<p>7. For 'Attacking', RRT uses <u>NaCl</u> dispersed into cloud at <u>mid-cloud level</u>, and simultaneously, <u>urea</u> at <u>cloud base</u> resulting in heavy rainfall. This is elaborately designed as to the substance and position of cloud to disperse, to give the best result, NOT a single component of urea as in '992. Therefore, although some chemical may sound alike and the process may sound indistinctive for someone NOT acquainted to the process of Rainmaking, but the manipulation by introduction of the chemicals as of RRT where 2 endothermic-hygroscopic chemicals are used simultaneously and to specified positions of a cloud is NOT obvious to person in the field, as NO ONE ever teaches such manipulation before despite rainmaking had been brought into practice as long as a few decades ago.</p>
<p>8. Fukuta ('203 as per Office Action 09.30/08, p.4, 1.1) yet <u>does not teach the use of AgI for "enhance" the volume of rainfall</u> as cited by the examiner. '203 (Cl. 1-2) teaches <b>only the use of liquid carbon dioxide</b> being sprayed laterally from nozzles of the aircraft to produce ice crystals where, <u>on the contrary</u>. Thus, the operation by '203 using AgI is unsuccessful regarding the volume of rainfall. Thus, as cited by the Examiner (09.30/08, p. 3, l. 22 &amp; p.4, 1.1) Neither Montmory ('271) nor Mather ('865) and Knollenberg ('992) teach the process of "enhancing". Fukuta ('203) does not teach the use of AgI Flares seeded into the top of a cloud ..... . to enhance the volume of rainfall</p>	<p>8. In the present application, although the use of AgI flare alone conventionally can not give significant amount of rainfall, it is thus carefully designed that to make huge amount of rainfall, such that 'attacking' must be made with much more sophisticate protocol than in the prior arts; that powder of endothermic-hygroscopic chemicals must be dispersed upwind at mid-cloud level and at cloud base level simultaneously, where glaciogenic chemical(s) must be seeded into the top of the cloud and super-cool chemical such as flakes of dry ice must be dispersed below (about 1,000 feet underneath) the cloud base. This must be accurately performed to achieve the best result. This protocol is virtually NOT obvious at all to any one skilled in the art <u>as none discloses</u> such combination use of as many of the chemicals in a sequence and at a</p>

**Table 1. Distinct Differences between subject matter  
of the present Patent application and the prior arts**

	<p>specific position of a cloud mass especially a mixed cloud (warm cloud and cool cloud, integrated) in the prior art, neither Montmory ('271) nor Mather ('865) and Knollenberg ('992) use AgI and other chemicals in the manner disclosed in RRT.</p>
<p>9. Nelson et al ('785) as cited in the Office Action 09.30/08, p.4, last line) teaches <b>only removing of water vapor (NOT 'moving')</b> from the atmosphere (Cl.1) to work as '<b>fog dissipation</b>' (Col.1, l.9-17), there is not a single word referred to as moving of cloud in said paragraph. They use the microencapsulation technology to provide size control and stabilization of seeding agent.</p>	<p>9. Moving of cloud in the present invention, RRT, with the use of powder of exothermic-hygroscopic chemical(s) dispersed into cloud mass and to the spaces between the cloud masses thus causes the lifting up and moving of cloud mass along the prevailing wind to be attacked and fall as rain onto the target locality, is distinctive and has not been taught by any of the references cited by the examiner.</p>
<p>In addition, they use only encapsulated non-corrosive seed agent, i.e. <b>crystalline urea and not calcium chloride</b> for <b>removing</b> water vapor to dissipate fog. No where in the disclosure ('785) teaches the moving of cloud from one area to another specified area as in RRT. In all their claims, the feature protected are only the encapsulation in a moisture permeable coating of the finely divided hygroscopic particulate material and the range of size.</p>	
<p>Calcium chloride (Col.2, l.30-34), referred to as corrosive hygroscopic material used for fog dissipation over harbors.....etc. and is not used in their disclosure.</p> <p>10. Although Fukuta ('203, Col. 2, l.51-Col. 3, l. 11) mentions of a method uses <b>dry ice pellets</b> but the pellets are <u>drop from above a supercooled cloud</u> ..... Due to buoyancy, the thermal stabilizes there without effectively developing any <u>precipitation</u>. Fukuta then teaches ('203, Col. 4, l.29-Col. 5, l. 17) that <b>it is necessary</b> to grow the generated ice crystals and let them attain a sufficient fall velocity. The ice crystal generation method of his invention is based on</p>	<p>10. RRT does not teach the use of <b>liquid</b> carbon dioxide in any steps of the Rainmaking procedure. What RRT uses for 'Enhancing' is dry ice in form of flakes to be dispersed below, which is about 1,000 feet underneath the cloud base, <u>outside a cloud mass</u>, NOT <u>spraying LC laterally from a nozzles of the aircraft into.... supercooled clouds</u> as that of Fukuta.</p>

**Table 1. Distinct Differences between subject matter  
of the present Patent application and the prior arts**

<p><b>Liquid carbon dioxide (LC) in-cloud</b></p> <p>seeding so that the crystals generated take the form of a linear horizontal thermal. The necessary condition for ice crystal growth is that each crystal in the thermal is surrounded by supercooled droplets</p> <p>..... .... The <b>second necessary</b> condition (Col. 4, 1.56) for ice crystal growth, i.e., time for the crystal growth and inclusion of supercooled cloud droplets into the thermal by turbulent diffusion, will thus be shortened in dry ice seeding so that the.....<u>It is the central feature of this invention</u> ('203; Col. 5, 1.5-17) to generate the slowly rolling-up.....<b>by seeding a liquid coolant such as LC from an aircraft penetrating through the cloud...the first necessary condition.....The slowness of ...which is the second necessary condition.</b></p> <p>Thus, Fukuta uses liquid carbon dioxide seeded through the cloud by <b>spraying the liquid coolant contained in the containers laterally from nozzles of the aircraft into....adjacent supercooled clouds</b> (Cl. 1 c. and Cl. 2)..... while in RRT, <b>flakes of dry ice</b> is dispersed at about 1,000 feet below or underneath cloud base which is outside the cloud base and thus outside the cloud mass (Cl. 1, 13 and in the specification p. 16 l.3-4). The two disclosures are therefore virtually different and distinctive.</p>	
--	--